Complete Summary

GUIDELINE TITLE

Preventing dental caries in children at high caries risk. Targeted prevention of dental caries in the permanent teeth of 6 to 16 year olds presenting for dental care. A national clinical guideline.

BIBLIOGRAPHIC SOURCE(S)

Preventing dental caries in children at high caries risk: targeted prevention of dental caries in the permanent teeth of 6-16 year olds presenting for dental care. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2000. 39 p. (SIGN publication; no. 47). [115 references]

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

Dental caries

GUIDELINE CATEGORY

Prevention

CLINICAL SPECIALTY

Dentistry
Family Practice
Internal Medicine
Pediatrics
Preventive Medicine

INTENDED USERS

Advanced Practice Nurses
Dentists
Nurses
Patients
Pharmacists
Physician Assistants
Physicians

GUIDELINE OBJECTIVE(S)

- To present evidence-based recommendations for the targeted prevention of dental caries in the permanent teeth of 6 to 16 years olds presenting for dental care.

TARGET POPULATION

Children and adolescents (6 to 16 year olds) presenting for dental care

INTERVENTIONS AND PRACTICES CONSIDERED

Primary Prevention

1. Risk assessment (including previous disease, diet, social factors, use of fluoride, plaque control, saliva, medical history and disability)
2. Behaviour modification:
    - Dental health education
    - Oral hygiene (tooth brushing with fluoride toothpaste)
    - Restriction of sugar consumption
    - Use of non-sugar sweeteners, in particular xylitol
    - Use of sugar-free chewing gum
    - Prescription of and use of sugar-free medicines
3. Tooth protection:
    - Sealants (resin, glass ionomer)
    - Fluoride tablets
    - Topical fluoride varnishes, such as Duraphat
    - Chlorhexidine varnishes

Secondary and Tertiary Prevention

1. Diagnosis:
    - Clinical examination
    - Bitewing radiographs
2. Management of carious lesions (occlusal, approximal, smooth surface caries):
    - Restorations (composite sealant, resin, or amalgam)
    - Removal and/or restoration
    - Re-restoration
    - Preventive care (versus operative interventions)

MAJOR OUTCOMES CONSIDERED

- Incidence of dental caries

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The literature review conducted for this guideline covered the Cochrane Library, Issue 2 1997, plus searches of Medline and HealthSTAR from 1985 to 1997. The evidence base was updated during the course of development of the guideline. Reference lists, existing systematic reviews, and guideline developer's own resources were used to trace older material. In view of the limited number of trials identified, the Medline and HealthSTAR searches were extended to cover all types of literature. Root caries was specifically excluded from the literature searches.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Statements of Evidence:

Ia: Evidence obtained from meta-analysis of randomized controlled trials.

Ib: Evidence obtained from at least one randomized controlled trial.

IIa: Evidence obtained from at least one well-designed controlled study without randomization.

IIb: Evidence obtained from at least one other type of well-designed quasi-experimental study.

III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.

IV: Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

METHODS USED TO ANALYZE THE EVIDENCE

Review of Published Meta-Analyses
Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

The Scottish Intercollegiate Guidelines Network (SIGN) carries out comprehensive systematic reviews of the literature using customized search strategies applied to a number of electronic databases and the Internet. This is often an iterative process whereby the guideline development group will carry out a search for existing guidelines and systematic reviews in the first instance and, after the results of this search have been evaluated, the questions driving the search may be redefined and focused before proceeding to identify lower levels of evidence.

Once papers have been selected as potential sources of evidence, the methodology used in each study is assessed to ensure its validity. SIGN has developed checklists to aid guideline developers to critically evaluate the methodology of different types of study design. The result of this assessment will affect the level of evidence allocated to the paper, which in turn will influence the grade of recommendation it supports.

Additional details can be found in the companion document titled "SIGN 50: A Guideline Developers' Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50]). Available from the SIGN Web site.

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The process for synthesizing the evidence base to form graded guideline recommendations is illustrated in the companion document titled "SIGN 50: A Guideline Developer's Handbook." (Edinburgh [UK]: Scottish Intercollegiate Guidelines Network. [SIGN publication; no. 50], available from the SIGN website.

Evidence tables should be compiled, summarizing all the validated studies identified from the systematic literature review relating to each key question. These evidence tables form an important part of the guideline development record and ensure that the basis of the guideline development group's recommendations is transparent.

In order to address how the guideline developer was able to arrive at their recommendations given the evidence they had to base them on, SIGN has introduced the concept of considered judgement.

Under the heading of considered judgement, guideline development groups are expected to summarise their view of the total body of evidence covered by each evidence table. This summary view is expected to cover the following aspects:

- Quantity, quality, and consistency of evidence
- Generalisability of study findings
- Applicability to the target population of the guideline
- Clinical impact (i.e., the extent of the impact on the target patient population, and the resources need to treat them.)

Guideline development groups are provided with a pro forma in which to record the main points from their considered judgement. Once they have considered these issues, the group are asked to summarise their view of the evidence and assign a level of evidence to it, before going on to derive a graded recommendation.

The assignment of a level of evidence should involve all those on a particular guideline development group or subgroup involved with reviewing the evidence in relation to each specific question. The allocation of the associated grade of recommendation should involve participation of all members of the guideline development group. Where the guideline development group is unable to agree a unanimous recommendation, the difference of opinion should be formally recorded and the reason for dissent noted.

The recommendation grading system is intended to place greater weight on the quality of the evidence supporting each recommendation, and to emphasise that the body of evidence should be considered as a whole, and not rely on a single study to support each recommendation. It is also intended to allow more weight to be given to recommendations supported by good quality observational studies where randomised controlled trials (RCTs) are not available for practical or ethical reasons. Through the considered judgement process guideline developers are also able to downgrade a recommendation where they think the evidence is not generalisable, not directly applicable to the target population, or for other reasons is perceived as being weaker than a simple evaluation of the methodology would suggest.

On occasion, there is an important practical point that the guideline developer may wish to emphasise but for which there is not, nor is their likely to be, any research evidence. This will typically be where some aspect of treatment is regarded as such sound clinical practice that nobody is likely to question it. These are marked in the guideline as "good practice points." It must be emphasized that these are not an alternative to evidence-based recommendations, and should only be used where there is no alternative means of highlighting the issue.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Grades of Recommendations

Grade A: Requires at least one randomized controlled trial (RCT) as part of a body of literature of overall good quality and consistency addressing the specific recommendation (Evidence levels Ia, Ib).

Grade B: Requires the availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation (Evidence levels IIa, IIb, III).

Grade C: Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality (Evidence level IV).

Good Practice Points: Recommended best practice based on the clinical experience of the guideline development group.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

External Peer Review
Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Successive drafts of the guideline were developed by synthesis of the literature, correspondence and full discussion at a National Open Meeting held in Edinburgh at the Royal College of Physicians, Edinburgh in March 1998. The guideline was submitted, in draft, for external peer review. Feedback from the National Meeting, specialist reviewers and other groups including a large audit group from the Health Boards was considered in detail by the guideline development group.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Note from the Scottish Intercollegiate Guidelines Network (SIGN) and National Guideline Clearinghouse (NGC): In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the original guideline document.

The strength of recommendation grading (A-C) and level of evidence (Ia-IV) are defined at the end of the â œMajor Recommendationsâ field.

<u>Primary Prevention of Dental Caries</u>

Keeping Children's Teeth Healthy Before Disease Occurs

B: An explicit caries risk assessment should be made for each child presenting for dental care.

B: The following factors should be considered when assessing caries risk:

- clinical evidence of previous disease
- dietary habits, especially frequency of sugary food and drink consumption
- social history, especially socio-economic status

- use of fluoride
- plaque control
- saliva
- medical history

Behaviour Modification in Children at High Caries Risk

A: Dental health education advice should be provided to individual patients at the chairside as this intervention has been shown to be beneficial.

A: Children should brush their teeth twice a day using toothpaste containing at least 1000 ppm fluoride. They should spit the toothpaste out and should not rinse out with water.

C: The need to restrict sugary food and drink consumption to meal times only should be emphasized.

B: Dietary advice to patients should encourage the use of non-sugar sweeteners, in particular xylitol, in food and drink.

B: Patients should be encouraged to use sugar-free chewing gum, particularly containing xylitol, when this is acceptable.

B: Clinicians should prescribe sugar-free medicines whenever possible and should recommend the use of sugar-free forms of non-prescription medicines.

Tooth Protection in Children at High Caries Risk

A: Sealants should be applied and maintained in the tooth pits/fissures of high caries-risk children.

B: The condition of sealants should be reviewed at each check-up.

B: Glass ionomer sealants should only be used when resin sealants are unsuitable.

B: Fluoride tablets (1 mg F daily) for daily sucking should be considered for children at high risk of decay.

B: A fluoride varnish (e.g. Duraphat) may be applied every four to six months to the teeth of high caries risk children.

B: Chlorhexidine varnish should be considered as an option for preventing caries.

<u>Secondary and Tertiary Prevention of Dental Caries</u>

Secondary: Limiting the Impact of Caries at an Early Stage

Tertiary: Rehabilitation of the Decayed Teeth with Further Preventive Care

Diagnosis of Dental Caries

B: Bitewing radiographs are recommended as an essential adjunct to a patient's first clinical examination.

B: The frequency of further radiographic examination should be determined by an assessment of the patient's caries risk.

Management of Caries Lesions

Occlusal Caries

A: If only part of the fissure system is involved in small to moderate dentine lesions with limited extension, the treatment of choice is a composite sealant restoration.

A: If caries extends clinically into dentine, then carious dentine should be removed and the tooth restored.

C: Dental amalgam is an effective filling material which remains the treatment of choice in many clinical situations. There is no evidence that amalgam restorations are hazardous to the general health.

Approximal Caries

A: Preventive care, e.g. topical fluoride varnish, rather than operative care is recommended when approximal caries is confined (radiographically or visually) to enamel.

B: In an approximal lesion requiring restoration, a conventional Class II restoration should be placed in preference to a tunnel preparation.

Re-restoration

B: The diagnosis of secondary caries is extremely difficult and clear evidence of involvement of active disease should be ascertained before replacing a restoration.

Definitions:

Grades of Recommendations:

A. Requires at least one randomised controlled trial as part of a body of literature of overall good quality and consistency addressing the specific recommendation. (Evidence levels Ia, Ib)
B. Requires the availability of well conducted clinical studies but no randomised clinical trials on the topic of recommendation. (Evidence levels IIa, IIb, III)
C. Requires evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities. Indicates an absence of directly applicable clinical studies of good quality. (Evidence level IV)

Statements of Evidence:

Ia: Evidence obtained from meta-analysis of randomized controlled trials.

Ib: Evidence obtained from at least one randomized controlled trial.

IIa: Evidence obtained from at least one well-designed controlled study without randomization.

IIb: Evidence obtained from at least one other type of well-designed quasi-experimental study.

III: Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies.

IV: Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The specific type of supporting evidence is explicitly identified in each section of the guideline.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Prevention of dental caries: Prevention of caries has great potential to achieve significant health gain, given that once an initial filling is placed a repetitive, costly, lifelong cycle of re-restoration occurs for many individuals.
- Establishment of good oral hygiene and dietary habits.

Subgroups Most Likely to Benefit:

Children and adolescents who are at high risk for caries because of previous disease, poor dietary habits, low socioeconomic status, lack of fluoride use, infrequent or poor dental hygiene, reduced saliva flow, or medical or physical compromise.

POTENTIAL HARMS

Restorations

- Concerns about mercury-related hazards have not been generally substantiated and are offset by equivalent, although questionable, concerns about potential oestrogen depleting effects of resin monomers associated with the dental polymers that are the most popular alternative materials.

Re-restorations

- The diagnosis of secondary caries is extremely difficult and there is a risk that the large numbers of false diagnoses of secondary caries will lead to unwarranted replacement and re-replacement of fillings.

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

This guideline is not intended to be construed or to serve as a standard of medical care. Standards of medical care are determined on the basis of all clinical data available for an individual case and are subject to changes as scientific knowledge and technology advance and patterns of care evolve.

These parameters of practice should be considered guidelines only. Adherence to them will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgment regarding a particular clinical procedure or treatment plan must be made by the doctor in light of the clinical data presented by the patient and the diagnostic and treatment options available.

Significant departures from the national guideline as expressed in the local guideline should be fully documented and the reasons for the differences explained. Significant departures from the local guideline should be full documented in the patient's case notes at the time the relevant decision is taken.

The guideline does not represent a comprehensive account of all possible preventive measures for dental caries. In some cases this is because there is insufficient, high quality research evidence available (to date, randomised controlled trials are infrequently carried out in dentistry). Within this document, gaps in the evidence have been highlighted for future research. In some instances where insufficient evidence has been found, statements are offered representing the consensus view of the multidisciplinary guideline development group as to recommended good clinical practice.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

This is a nationally agreed guideline which may require adaptation to meet local conditions and restraints. For example, parts of the national guideline may have to be adjusted to conform with the structures set out in the general dental service contract or in practice protocols. The framework and contents of this national

guideline should therefore be adapted actively to local situations so that the guideline can best influence the clinical care of children across Scotland. A model is presented in Figure 1 of section 6 in the original guideline document which was successfully used to produce and implement local guidelines following publication of the Scottish Intercollegiate Guidelines Network guideline on prevention of visual impairment in diabetes.

See the original guideline document for information related to health service implications of implementation and implementation issues for local discussion.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Preventing dental caries in children at high caries risk: targeted prevention of dental caries in the permanent teeth of 6-16 year olds presenting for dental care. A national clinical guideline. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network (SIGN); 2000. 39 p. (SIGN publication; no. 47). [115 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000 Dec

GUIDELINE DEVELOPER(S)

Scottish Intercollegiate Guidelines Network - National Government Agency [Non-U.S.]

SOURCE(S) OF FUNDING

Scottish Executive Health Department

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Guideline Development Group: Professor Nigel Pitts (Chairman); Dr Chris Deery; Dr Dafydd Evans; Mr Alan Gerrish; Dr Mike Haughney; Dr Iain Hunter; Dr Helen Lamont; Mr Jim MacCafferty; Mr Martyn Merrett; Professor Philip Sutcliffe; Mr Patrick Sweeney; Mrs Gail Topping.

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

All members of the Scottish Intercollegiate Guidelines Network (SIGN) guideline development groups are required to complete a declaration of interests, both personal and non-personal. A personal interest involves payment to the individual concerned, e.g., consultancies or other fee-paid work commissioned by or shareholdings in the pharmaceutical industry; a non-personal interest involves payment which benefits any group, unit or department for which the individual is responsible, e.g., endowed fellowships or other pharmaceutical industry support. SIGN guideline group members should be able to act as independently of external commercial influences as possible, therefore, individuals who declare considerable personal interests may be asked to withdraw from the group. Details of the declarations of interest of any guideline development group member(s) are available from the SIGN executive.

GUIDELINE STATUS

This is the current release of the guideline.

This guideline was issued in 2000 and will be reviewed in 2002 or sooner if new evidence becomes available.

Any amendments to the guideline in the interim period will be noted on the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

GUIDELINE AVAILABILITY

Electronic copies: Available from the Scottish Intercollegiate Guidelines Network (SIGN) Web site:

- HTML format
- Portable Document Format (PDF)

AVAILABILITY OF COMPANION DOCUMENTS

The following are available:

- Quick reference guide: Preventing dental caries in Children at high caries risk: Targeted prevention of dental caries in the permanent teeth of 6 to 16 year olds presenting for dental care. Edinburgh (Scotland): Scottish Intercollegiate

Guidelines Network, 2000 Dec. 2 p. Available in Portable Document Format (PDF) from the Scottish Intercollegiate Guidelines Network (SIGN) Web site.

- Preventing dental caries in children at high caries risk - supporting material [online]. Available from the SIGN Web site.
- SIGN 50: A guideline developer's handbook. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001 Feb. (SIGN publication; no. 50). Electronic copies available from the SIGN Web site.
- Appraising the quality of clinical guidelines. The SIGN guide to the AGREE (Appraisal of Guidelines Research and Evaluation) guideline appraisal instrument. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network, 2001. Available from the SIGN Web site.
- A background paper on the legal implications of guidelines. Edinburgh (Scotland): Scottish Intercollegiate Guidelines Network.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on October 17, 2001. The information was verified by the guideline developer as of December 17, 2001.

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